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MT7615 EEPROM Content Programming guide

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Document Revision History

Revision	Date	Author	Description
1.0	2015-10-07	AlexCC Lin	Initial Draft
1.1	2015-11-17	AlexCC Lin	modify
1.2	2015-12-23	SP Hsu	Modify(2G TX power offset definition description)
1.3	2016-01-06	SP Hsu	Add eLNA RX gain compensation offset definition description

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1 General Description

1.1 General Descriptions

The MT7615 EEPROM layout provides configuration for vendor/product ID, SW setting, RF TX power setting.

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2 MT7615 EEPROM Layout

Offset	Default (hex)	b15 ~b8	b7 ~ b0
00h	7615	Chip ID	
02h	0800	EEPROM Version	
04h	FFFF	Mac Address [15:0]	
06h	FFFF	Mac Address [31:16]	
08h	FFFF	Mac Address [47:32]	
0Ah~32h	FFFF	ASIC Reserved*	
34h	0044	NIC Configuration 0	
36h	6000	NIC Configuration 1	
38h	0000	Co-clock disable	ASIC Reserved*
3Ah	0000	LED Mode	ASIC Reserved*
3Ch	0000	ASIC Reserved*	ePA/eLNA control polarity
3Eh	0000	2.4G 3T/2T Tx power offset*	Wifi Configuration
40h	0000	5G 4T/3T Tx power offset*	5G 2T/2.4G 4T Tx power offset*
42h	0044	NIC Configuration 2	
44h	0004	ASIC Reserved*	CCK Tx stream setting
46h	0000	ASIC Reserved*	ASIC Reserved*
48h	0000	ASIC Reserved*	ASIC Reserved*
4Ah	0000	2.4G Tx iPA DPD calibration*	ASIC Reserved*
4Ch	0000	5G Tx iPA DPD calibration*	ASIC Reserved*
4Eh	01E0	ASIC Reserved*	ASIC Reserved*
50h	0000	5G Tx ePA DPD calibration*	2.4G Tx ePA DPD calibration*
52h	B300	ASIC Reserved *	Calibration Data to Flash
54h	B640	Thermal sensor compensation	ASIC Reserved*
56h	CC40	TX0 2.4G PA TSSI offset	TX0 2.4G PA TSSI slope
58h	0014	TX0 2.4G TX power offset low	TX0 2.4G TX power
5Ah	0000	TX0 2.4G TX power offset high	TX0 2.4G TX power offset middle
5Ch	C940	TX1 2.4G PA TSSI offset	TX1 2.4G PA TSSI slope
5Eh	0014	TX1 2.4G TX power offset low	TX1 2.4G TX power

Offset	Default (hex)	b15 ~b8	b7 ~ b0
60h	0000	TX1 2.4G TX power offset high	TX1 2.4G TX power offset middle
62h	C940	TX2 2.4G PA TSSI offset	TX2 2.4G PA TSSI slope
64h	0014	TX2 2.4G TX power offset low	TX2 2.4G TX power
66h	0000	TX2 2.4G TX power offset high	TX2 2.4G TX power offset middle
68h	CA40	TX3 2.4G PA TSSI offset	TX3 2.4G PA TSSI slope
6Ah	0014	TX3 2.4G TX power offset low	TX3 2.4G TX power
6Ch	0000	TX3 2.4G TX power offset high	TX3 2.4G TX power offset middle
6Eh	C6C0	TX0 5G PA TSSI offset (group0)	TX0 5G PA TSSI slope (group0) (4910~5140)(CH184 188 192 196 8 12 16)
70h	0014	TX0 5G TX power offset low(group0)	TX0 5G TX power (group0)
72h	C000	TX0 5G PA TSSI slope (group1) (5140~5250) (CH36 40 44 48)	TX0 5G TX power offset high (group0)
74h	14C6	TX0 5G TX power (group1)	TX0 5G PA TSSI offset (group1)
76h	0000	TX0 5G TX power offset high (group1)	TX0 5G TX power offset low(group1)
78h	C5C0	TX0 5G PA TSSI offset (group2)	TX0 5G PA TSSI slope (group2) (5250~5360) (CH52 56 60 64)
7Ah	0014	TX0 5G TX power offset low(group2)	TX0 5G TX power (group2)
7Ch	C000	TX0 5G PA TSSI slope (group3) (5360~5470)(Reserved)	TX0 5G TX power offset high (group2)
7Eh	14C5	TX0 5G TX power (group3)	TX0 5G PA TSSI offset (group3)
80h	0000	TX0 5G TX power offset high (group3)	TX0 5G TX power offset low(group3)
82h	C3C0	TX0 5G PA TSSI offset (group4)	TX0 5G PA TSSI slope (group4) (5470~5580)(CH100 104 108 112 116)
84h	0014	TX0 5G TX power offset low(group4)	TX0 5G TX power (group4)
86h	C000	TX0 5G PA TSSI slope (group5) (5580~5690)(CH120 124 128 132 136)	TX0 5G TX power offset high (group4)
88h	14C1	TX0 5G TX power (group5)	TX0 5G PA TSSI offset (group5)
8Ah	0000	TX0 5G TX power offset high (group5)	TX0 5G TX power offset low(group5)
8Ch	C0C0	TX0 5G PA TSSI offset (group6)	TX0 5G PA TSSI slope (group6) (5690~5800) (CH140 144 149 153 157)
8Eh	0014	TX0 5G TX power offset low(group6)	TX0 5G TX power (group6)
90h	C000	TX0 5G PA TSSI slope (group7)	TX0 5G TX power offset high (group6)

Offset	Default (hex)	b15 ~b8	b7 ~ b0
		(5800~5925)(CH161 165)	
92h	14C0	TX0 5G TX power (group7)	TX0 5G PA TSSI offset (group7)
94h	0000	TX0 5G TX power offset high (group7)	TX0 5G TX power offset low(group7)
96h	C4C0	TX1 5G PA TSSI offset (group0)	TX1 5G PA TSSI slope (group0) (4910~5140)(CH184 188 192 196 8 12 16)
98h	0014	TX1 5G TX power offset low(group0)	TX1 5G TX power (group0)
9Ah	C000	TX1 5G PA TSSI slope (group1) (5140~5250) (CH36 40 44 48)	TX1 5G TX power offset high (group0)
9Ch	14C2	TX1 5G TX power (group1)	TX1 5G PA TSSI offset (group1)
9Eh	0000	TX1 5G TX power offset high (group1)	TX1 5G TX power offset low(group1)
A0h	C3C0	TX1 5G PA TSSI offset (group2)	TX1 5G PA TSSI slope (group2) (5250~5360) (CH52 56 60 64)
A2h	0014	TX1 5G TX power offset low(group2)	TX1 5G TX power (group2)
A4h	C000	TX1 5G PA TSSI slope (group3) (5360~5470)(Reserved)	TX1 5G TX power offset high (group2)
A6h	14C1	TX1 5G TX power (group3)	TX1 5G PA TSSI offset (group3)
A8h	0000	TX1 5G TX power offset high (group3)	TX1 5G TX power offset low(group3)
AAh	C1C0	TX1 5G PA TSSI offset (group4)	TX1 5G PA TSSI slope (group4) (5470~5580)(CH100 104 108 112 116)
ACh	0014	TX1 5G TX power offset low(group4)	TX1 5G TX power (group4)
A Eh	C000	TX1 5G PA TSSI slope (group5) (5580~5690)(CH120 124 128 132 136)	TX1 5G TX power offset high (group4)
B0h	14C0	TX1 5G TX power (group5)	TX1 5G PA TSSI offset (group5)
B2h	0000	TX1 5G TX power offset high (group5)	TX1 5G TX power offset low(group5)
B4h	BFC0	TX1 5G PA TSSI offset (group6)	TX1 5G PA TSSI slope (group6) (5690~5800) (CH140 144 149 153 157)
B6h	0014	TX1 5G TX power offset low(group6)	TX1 5G TX power (group6)
B8h	C000	TX1 5G PA TSSI slope (group7) (5800~5925)(CH161 165)	TX1 5G TX power offset high (group6)
BAh	14BE	TX1 5G TX power (group7)	TX1 5G PA TSSI offset (group7)

Offset	Default (hex)	b15 ~b8	b7 ~ b0
BCh	0000	TX1 5G TX power offset high (group7)	TX1 5G TX power offset low(group7)
BEh	C6C6	2.4GHz TX power for CCK 5.5M/11M(delta,dB)	2.4GHz TX power for CCK 1M/2M(delta,dB)
C0h	C4C4	2.4GHz TX power for OFDM 12M/18M(delta,dB)	2.4GHz TX power for OFDM 6M/9M(delta,dB)
C2h	00C4	2.4GHz TX power for OFDM 48M(delta,dB)	2.4GHz TX power for OFDM 24M/36M(delta,dB)
C4h	C200	2.4G TX power for HT20 MCS=0/8/16/24(delta,dB) 2.4G Tx power for VHT20 MCS=0; 1SS~4SS(delta,dB)	2.4GHz TX power for OFDM 54M(delta,dB)
C6h	C200	2.4G TX power for HT20 MCS=1,2/9,10/17,18/25,26(delta,dB) 2.4G TX power for VHT20 MCS1/2; 1SS~4SS (delta, dB)	2.4G TX power for HT40 MCS=32(delta,dB)
C8h	81C1	2.4G TX power for HT20 MCS=5/13/21/29(delta,dB)	2.4G TX power for HT20 MCS=3,4/11,12/19,20/27,28(delta,dB) 2.4G TX power for VHT20 MCS=3,4 ; 1SS~4SS(delta,dB)
CAh	8181	2.4G TX power for HT20 MCS=7/15/23/31(delta,dB) 2.4G TX power for VHT20 MCS=7; 1SS~4SS(delta,dB)	2.4G TX power for HT20 MCS=6/14/22/30(delta,dB) 2.4G TX power for VHT20 MCS=5, 6; 1SS~4SS(delta,dB)
CCh	C285	2.4G TX power for HT40 MCS=0/8/16/24(delta,dB)	2.4G Tx power for VHT20 MCS8(1SS~4SS)(delta,dB)
CEh	00C2	2.4G TX power for HT40 MCS=3,4/11,12/19,20/27,28(delta,dB)	2.4G TX power for HT40 MCS=1,2/9,10/17,18/25,26(delta,dB)
D0h	8282	2.4G TX power for HT40 MCS=6/14/22/30(delta,dB)	2.4G TX power for HT40 MCS=5/13/21/29(delta,dB)
D2h	8182	2.4G Tx power delta for VHT40 (delta,dB) reference point VHT20	2.4G TX power for HT40 MCS=7/15/23/31(delta,dB)
D4h	C500	5GHz TX power for OFDM 6M/9M(delta,dB)	2.4G Tx power delta for LG VHT40 duplicate mode(delta,dB)
D6h	C5C5	5GHz TX power for OFDM 24M/36M(delta,dB)	5GHz TX power for OFDM 12M/18M(delta,dB)
D8h	0000	5GHz TX power for OFDM 54M(delta,dB)	5GHz TX power for OFDM 48M(delta,dB)
DAh	00C3	5G TX power for HT40 MCS=32(delta,dB)	5G TX power for HT20 MCS=0/8/16/24(delta,dB) 5G TX power for VHT20 MCS=0; 1SS~4SS (delta,dB)
DCh	C3C3	5G TX power for HT20 MCS=3,4/11,12/19,20/27,28(delta,dB) 5G TX power for VHT20 MCS=3,4; 1SS~4SS (delta,dB)	5G TX power for HT20 MCS=1,2/9,10/17,18/25,26(delta,dB) 5G TX power for VHT20 MCS=1,2; 1SS~4SS (delta,dB)
DEh	8282	5G TX power for HT20 MCS=6/14/22/30(delta,dB) 5G TX power for VHT20 MCS=6; 1SS~4SS (delta,dB)	5G TX power for HT20 MCS=5/13/21/29(delta,dB) 5G TX power for VHT20 MCS=5 ; 1SS~4SS (delta,dB)
E0h	8382	5G TX power for VHT20 MCS=8; 1SS~4SS (delta,dB)	5G TX power for HT20 MCS=7/15/23/31(delta,dB) 5G TX power for VHT20 MCS=7; 1SS~4SS (delta,dB)
E2h	C384	5G TX power for HT40 MCS=0/8/16/24(delta,dB)	5G TX power for VHT20 MCS=9; 3SS (delta,dB)
E4h	C3C3	5G TX power for HT40 MCS=3,4/11,12/19,20/27,28(delta,dB)	5G TX power for HT40 MCS=1,2/9,10/17,18/25,26(delta,dB)
E6h	8282	5G TX power for HT40 MCS=6/14/22/30(delta,dB)	5G TX power for HT40 MCS=5/13/21/29(delta,dB)
E8h	0082	5G Tx power for delta VHT40 (delta,dB) reference point VHT20	5G TX power for HT40 MCS=7/15/23/31(delta,dB)
EAh	8200	5G Tx power for delta VHT160-C (delta,dB) reference point VHT20	5G Tx power for delta VHT80 (delta,dB) reference point VHT20
ECh	0082	5G Tx power for delta LG VHT40 duplicate mode(delta,dB) reference point VHT20	5G Tx power for delta VHT160-NC (delta,dB) reference point VHT20
EEh	0000	5G Tx power for delta LG VHT80 duplicate mode(delta,dB) reference point VHT20	5G Tx power for delta LG VHT80 duplicate mode(delta,dB) reference point VHT20
F0h	0085	ASIC Reserved*	2.4G TX power for VHT20 MCS=9; 3SS (delta,dB)
F2h	0000	TSSI off 5G Tx power SKU (54M , OFDM)	TSSI off 2.4G Tx power SKU (54M , OFDM)

Offset	Default (hex)	b15 ~b8	b7 ~ b0
F4h	00A8	Xtal trim 2 nd compensation	Frequency offset(Xtal trim)
F6h	8700	Rcal0	XTAL trim 3 rd compensation
F8h	0000	ASIC Reserved*	Thermal compensation offset
FAh	0000	ASIC Reserved*	ASIC Reserved*
FCh	0000	ASIC Reserved*	ASIC Reserved*
FEh	8700	Rcal1	ASIC Reserved*
100h~11Fh	0000	ASIC Reserved*	ASIC Reserved*
120h	0000	2.4G eLNA Received Mode (NF)	2.4G eLNA Received Mode (Gain)
122h	0000	2.4G eLNA Bypass Mode (Gain)	2.4G eLNA Received Mode (P1dB)
124h	0000	2.4G eLNA Bypass Mode (P1dB)	2.4G eLNA Bypass Mode (NF)
126h	0000	5G eLNA Received Mode (NF)	5G eLNA Received Mode (Gain)
128h	0000	5G eLNA Bypass Mode (Gain)	5G eLNA Received Mode (P1dB)
12Ah	0000	5G eLNA Bypass Mode (P1dB)	5G eLNA Bypass Mode (NF)
12Ch	0000	Reserved	Reserved
12Eh	0000	Reserved	Reserved
130h	0000	2.4G RSSI1 offset*	2.4G RSSI0 offset*
132h	0000	2.4G RSSI3 offset*	2.4G RSSI2 offset*
134h	0000	5G RSSI1 offset*	5G RSSI0 offset*
136h	0000	5G RSSI3 offset*	5G RSSI2 offset*
138h~13Eh	0000	Reserved for Customer specific	Reserved for Customer specific
140h	C5C0	TX2 5G PA TSSI offset (group0)	TX2 5G PA TSSI slope (group0) (4910~5140)(CH184 188 192 196 8 12 16)
142h	0014	TX2 5G TX power offset low(group0)	TX2 5G TX power (group0)
144h	C000	TX2 5G PA TSSI slope (group1) (5140~5250) (CH36 40 44 48)	TX2 5G TX power offset high (group0)
146h	14CA	TX2 5G TX power (group1)	TX2 5G PA TSSI offset (group1)
148h	0000	TX2 5G TX power offset high (group1)	TX2 5G TX power offset low(group1)
14Ah	CBC0	TX2 5G PA TSSI offset (group2)	TX2 5G PA TSSI slope (group2) (5250~5360) (CH52 56 60 64)

Offset	Default (hex)	b15 ~b8	b7 ~ b0
14Ch	0014	TX2 5G TX power offset low(group2)	TX2 5G TX power (group2)
14Eh	C000	TX2 5G PA TSSI slope (group3) (5360~5470)(Reserved)	TX2 5G TX power offset high (group2)
150h	14C2	TX2 5G TX power (group3)	TX2 5G PA TSSI offset (group3)
152h	0000	TX2 5G TX power offset high (group3)	TX2 5G TX power offset low(group3)
154h	CAC0	TX2 5G PA TSSI offset (group4)	TX2 5G PA TSSI slope (group4) (5470~5580)(CH100 104 108 112 116)
156h	0014	TX2 5G TX power offset low(group4)	TX2 5G TX power (group4)
158h	C000	TX2 5G PA TSSI slope (group5) (5580~5690)(CH120 124 128 132 136)	TX2 5G TX power offset high (group4)
15Ah	14CB	TX2 5G TX power (group5)	TX2 5G PA TSSI offset (group5)
15Ch	0000	TX2 5G TX power offset high (group5)	TX2 5G TX power offset low(group5)
15Eh	C2C0	TX2 5G PA TSSI offset (group6)	TX2 5G PA TSSI slope (group6) (5690~5800) (CH140 144 149 153 157)
160h	0014	TX2 5G TX power offset low(group6)	TX2 5G TX power (group6)
162h	C000	TX2 5G PA TSSI slope (group7) (5800~5925)(CH161 165)	TX2 5G TX power offset high (group6)
164h	14BF	TX2 5G TX power (group7)	TX2 5G PA TSSI offset (group7)
166h	0000	TX2 5G TX power offset high (group7)	TX2 5G TX power offset low(group7)
168h	C5C0	TX3 5G PA TSSI offset (group0)	TX3 5G PA TSSI slope (group0) (4910~5140)(CH184 188 192 196 8 12 16)
16Ah	0014	TX3 5G TX power offset low(group0)	TX3 5G TX power (group0)
16Ch	C000	TX3 5G PA TSSI slope (group1) (5140~5250) (CH36 40 44 48)	TX3 5G TX power offset high (group0)
16Eh	14C3	TX3 5G TX power (group1)	TX3 5G PA TSSI offset (group1)
170h	0000	TX3 5G TX power offset high (group1)	TX3 5G TX power offset low(group1)
172h	C1C0	TX3 5G PA TSSI offset (group2)	TX3 5G PA TSSI slope (group2) (5250~5360) (CH52 56 60 64)
174h	0014	TX3 5G TX power offset low(group2)	TX3 5G TX power (group2)
176h	C000	TX3 5G PA TSSI slope (group3) (5360~5470)(Reserved)	TX3 5G TX power offset high (group2)
178h	14C1	TX3 5G TX power (group3)	TX3 5G PA TSSI offset (group3)
17Ah	0000	TX3 5G TX power offset high (group3)	TX3 5G TX power offset low(group3)
17Ch	C2C0	TX3 5G PA TSSI offset (group4)	TX3 5G PA TSSI slope (group4) (5470~5580)(CH100 104 108 112 116)
17Eh	0014	TX3 5G TX power offset low(group4)	TX3 5G TX power (group4)
180h	C000	TX3 5G PA TSSI slope (group5) (5580~5690)(CH120 124 128 132 136)	TX3 5G TX power offset high (group4)
182h	14C2	TX3 5G TX power (group5)	TX3 5G PA TSSI offset (group5)
184h	0000	TX3 5G TX power offset high (group5)	TX3 5G TX power offset low(group5)

Offset	Default (hex)	b15 ~b8	b7 ~ b0
186h	C2C0	TX3 5G PA TSSI offset (group6)	TX3 5G PA TSSI slope (group6) (5690~5800) (CH140 144 149 153 157)
188h	0014	TX3 5G TX power offset low(group6)	TX3 5G TX power (group6)
18Ah	C000	TX3 5G PA TSSI slope (group7) (5800~5925)(CH161 165)	TX3 5G TX power offset high (group6)
18Ch	14C2	TX3 5G TX power (group7)	TX3 5G PA TSSI offset (group7)
18Eh	0000	TX3 5G TX power offset high (group7)	TX3 5G TX power offset low(group7)
190h	0000	2.4G -6 step number	2.4G -7 step number
192h	0000	2.4G -4 step number	2.4G -5 step number
194h	0000	2.4G -2 step number	2.4G -3 step number
196h	0000	2.4G -0 step number	2.4G -1 step number
198h	0000	2.4G reference temp	2.4G reference step
19Ah	0000	2.4G +2 step number	2.4G +1 step number
19Ch	0000	2.4G +4 step number	2.4G +3 step number
19Eh	0000	2.4G +6 step number	2.4G +5 step number
1A0h	0000	Reserved	2.4G +7 step number
1A2h	0000	5G -6 step number	5G -7 step number
1A4h	0000	5G -4 step number	5G -5 step number
1A6h	0000	5G -2 step number	5G -3 step number
1A8h	0000	5G -0 step number	5G -1 step number
1AAh	0000	5G reference temp	5G reference step
1Ach	0000	5G +2 step number	5G +1 step number
1AEh	0000	5G +4 step number	5G +3 step number
1B0h	0000	5G +6 step number	5G +5 step number
1B2h	0000	Reserved	5G +7 step number
1B4h~1BFh	0000	Reserved	Reserved
1C0h~1F3h	0000	Reserved for iBF	
1F4~21Fh	0000	ASIC Reserved*	ASIC Reserved*
220h~309h	0000	Reserved for iBF	
30Ah	0000	Mac Address 2 [15:0]	
30Ch	0000	Mac Address 2 [31:16]	
30Eh	0000	Mac Address 2 [47:32]	
310h~335h	0000	Reserved for 11v	
336h~33Fh	0000	Reserved	
340h~35Dh	0000	Reserved for iBF	
35Eh~3ABh	0000	eLNA gain compensation offset	

Offset	Default (hex)	b15 ~b8	b7 ~ b0
3ACh~3BFh	0000	ASIC Reserved*	ASIC Reserved*

ASIC Reserved* it's reserved for HW ASIC.

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2.1 E2PROM layout version # (02h)

Value	Description
10h	Formal Version 5.1.
1 ~ 255	Invalid version. Treat as version 0.

2.2 NIC Configuration 0 (0x34)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Reserved		Board type		Reserved	Ext ernal PA	Reserved		TX Path setting							RX Path setting
Reserved		Reserved		Reserved		Reserved		1:1TX 2: 2TX 3: 3TX 4: 4TX				1: 1RX 2: 2RX 3: 3RX 4: 4RX			

NIC Configuration 0 Register Bit Fields Description

Offset	Field	Description
34h	3:0	RX front-end architecture in the system. 0 (0000): Reserved. 1 (0001): 1 RX front-end in the system. 2 (0010): 2 RX front-end in the system. 3 (0011): 3 RX front-end in the system. 4 (0100): 4 RX front-end in the system. 5 ~ F (0101 ~ 1111): Reserved.
	7:4	TX front-end architecture in the system. 0 (0000): Reserved. 1 (0001): 1 TX front-end in the system. 2 (0010): 2 TX front-end in the system. 3 (0011): 3 TX front-end in the system. 4 (0100): 4 TX front-end in the system. 5~ F (0101 ~ 1111): Reserved.
35h	9:8	Reserved

Offset	Field	Description
	10	External PA current setting – the IO driving current setting for external PA control pin(PAPE) 1: 8 mA 0: 16mA (default)
	11	Reserved.
	13:12	Reserved for define the board type.
	15:14	Reserved.

2.3 NIC Configuration 1 (0x36)

7	6	5	4	3	2	1	0
WPS PBC	5G side band for 40M BW	2.4G side band for 40M BW	Proprietary Test bit	Reserved	Reserved	Tx temp. scheme en	HW CTRL
0: off (D) 1: on	0: off(D) 1: on	0: off 1: on(D)	0: off(D) 1: on			0: off(D) 1: on	0: off(D) 1: on

15	14	13	12	11	10	9	8
Reserved	5G TSSI power compensation enable	TSSI Power compensation en	Antenna Diversity		Reserved	40M BW in 5G band	40M BW in 2.4G band
0: off (D) 1: on	0: off (D) 1: on	0: off(D) 1: on	00: Disable (D)			0: on (D) 1: off	0: on (D) 1: off

NIC Configuration 1 Register Bit Fields Description

Offset	Field	Description
36h	0	Hardware Radio Control. 0: disable hardware radio control (default value). 1: enable hardware radio control. When “hardware radio control” bit is enabled (=1), the driver will read MAC’s radio-off GPIO status. When radio-off pin is low, the radio is disabled. When radio-off pin is high, the radio is enabled. The Radio ON/OFF is controlled by both software UI and MAC’s GPIO pin.

Offset	Field	Description
	1	TX power temperature compensation scheme enable 0 : disable temperature compensation 1 : Enable temperature compensation This bit will disable/enable temperature compensation scheme. While this bit is enabled, TC table ,0x190~0x1B2, function works. For TC table usage, please take the TC application note for reference.
	2	Reserved
	3	Reserved
	4	Proprietary TEST BIT. For debug purpose. Default value is 0.
	5	2.4GHz side band for 40MHz BW. For debug purpose.
	6	5G side band for 40M BW For debug purpose.
	7	WPS Push Button Configuration control. 0: disable WPS PBC control (default value). 1: enable WPS PBC control. The WPS PBC function is controlled through WPS GPIO.
37h	8	40M BW in 2.4GHz band. 0: enable 40MHz bandwidth for 2.4GHz band 1: disable 40MHz bandwidth for 2.4GHz band
	9	40M BW in 5G band 0: enable 40MHz bandwidth for 5GHz band. 1: disable 40MHz bandwidth for 5GHz band.
	10	Reserved
	12:11	Antenna Diversity control. Bit[12:11]: 00: disable diversity function (default value). *Not supported in 7615
	13	2.4G TSSI power compensation enable 0 : disable TSSI power compensation , use per-channel ALC code 1 : enable TSSI power compensation, TSSI slop offset scheme.

Offset	Field	Description
	14	5G TSSI power compensation enable 0 : disable TSSI power compensation , use per-channel ALC code 1 : enable TSSI power compensation, TSSI slop offset scheme.
	15	Reserved

2.4 Co-Clock Buffer Disable(0x39)

7	6	5	4	3	2	1	0
Reserved							Co-clock disable
Reserved							0:co_clk enable 1:co_clk disable

WIFI Configuration Register Bit Fields Description

Offset	Field	Description
39h	0	co_clk disable bit (SW stage) 0 : co_clk enable 1 : co_clk disable

2.5 ePA/eLNA polarity control(0x3C)

7	6	5	4	3	2	1	0
Reserved	Reserved	Inverse polarity_PA_EN_Gx	Inverse polarity_LN_A_EN_Gx	Inverse polarity_PA_EN_Ax	Inverse polarity_LN_A_EN_Ax	Inverse polarity_TR_SW_P_Gx_Ax	Inverse polarity_TR_SW_N_Gx_Ax
		0: default 1: inverse polarity	0: default 1: inverse polarity	0: default 1: inverse polarity	0: default 1: inverse polarity	0: default 1: inverse polarity	0: default 1: inverse polarity

ePA/eLNA polarity Register Bit Fields Description

Offset	Field	Description
3Ch	0	Inverse polarity_TRSW_N_GxAx 0: default 1: inverse polarity
	1	Inverse polarity_TRSW_P_GxAx 0: default 1: inverse polarity
	2	Inverse polarity_LNA_EN_Ax 0: default 1: inverse polarity
	3	Inverse polarity_PA_EN_Ax 0: default 1: inverse polarity
	4	Inverse polarity_LNA_EN_Gx 0: default 1: inverse polarity
	5	Inverse polarity_PA_EN_Gx 0: default 1: inverse polarity
	6	Reserved
	7	Reserved

2.6 LED Mode Setting (0x3B)

Reserved.

2.7 WIFI Configuration (0x3E)

7	6	5	4	3	2	1	0
Reserved	Smart Antenna	Band Selection		2.4G Configuration	PA/LNA	5G Configuration	PA/LNA
	0: not support 1: support	Dual band selectable : 00 5G only : 01 2.4G only : 10 DBDC : 11		iPAiLNA: 00 iPAeLNA : 01 ePAeLNA : 10 Reserved : 11		iPAiLNA: 00 iPAeLNA : 01 ePAeLNA : 10 Reserved : 11	

WIFI Configuration Register Bit Fields Description

Offset	Field	Description
3Eh	1:0	Indicate System board setting of 5G PA/LNA Configuration 00 : iPAiLNA 01 : iPAeLNA 10 : ePAeLNA 11 : Reserved
	3:2	Indicate System board setting of 2.4G PA/LNA Configuration 00 : iPAiLNA 01 : iPAeLNA 10 : ePAeLNA 11 : Reserved
	5:4	Band Selection Dual band selectable : 00 5G only : 01 2.4G only : 10 DBDC : 11
	6	Smart Antenna 0: not support 1: support
	7	Reserved

2.8 NIC Configuration 2 (0x42)

Bit <15:13>	12	11	10:9	8	7	6	5	4	3	2	1	0
Reserved	Reserved	Reserved	Xtal	HW	TX Stream			RX Stream				

			option	Ant Div	1: 1 Stream 2: 2 Stream 3: 3 Stream 4: 4 Stream	1: 1 Stream 2: 2 Stream 3: 3 Stream 4: 4 Stream
--	--	--	--------	------------	--	--

Note:

1. The 1 stream support MCS0~MCS7. The 2 stream support MCS0~MCS15.
2. Stream setting should be equal or less than path setting of EEPROM (0x34)
3. Default=0x00 means that based on the path setting (0x34) for MAX capability.

NIC Configuration 2 Register Bit Fields Description

Offset	Field	Description
42h	3:0	RX stream. 0 (0000): Reserved 1 (0001): 1 RX stream 2 (0010): 2 RX stream 3 (0011): 3 RX stream 4 (0100): 4 RX stream 5 ~ F (0101 ~ 1111): Reserved.
	7:4	TX stream. 0 (0000): Reserved 1 (0001): 1 TX stream 2 (0010): 2 TX stream 3 (0011): 3 TX stream 4 (0100): 4 TX stream 5 ~ F (0101 ~ 1111): Reserved.
43h	8	HW Antenna Diversity 0 : Disable 1: Enable *not support in 7615
	10:9	*not support in 7615
	11	Reserved.
	12	Reserved
	15:13	Reserved

2.9 2.4G iPA DPD Calibraion (0x4B)

7	6	5	4	3	2	1	0
Reserved	Reserved	2.4G iPA Tx DPD calibration disable bit	Reserved	Reserved	Reserved	Reserved	Reserved
		1: disable 0: enable					

Calibration Data to Flash Bit Fields Description

Offset	Field	Description
4Bh	4:0	Reserved
	5	2.4G iPA Tx DPD calibration disable bit 1: disable 0: enable(default)
	7:6	Reserved

2.10 5G iPA DPD Calibraion (0x4D)

7	6	5	4	3	2	1	0
Reserved	Reserved	5G iPA Tx DPD calibration disable bit	Reserved	Reserved	Reserved	Reserved	Reserved
		1: disable 0: enable					

Calibration Data to Flash Bit Fields Description

Offset	Field	Description
4Dh	4:0	Reserved
	5	5G iPA Tx DPD calibration disable bit 1: disable 0: enable(default)
	7:6	Reserved

2.11 2.4G ePA DPD Calibraion (0x50)

7	6	5	4	3	2	1	0
Reserved	Reserved	2.4G ePA Tx DPD calibration disable bit	Reserved	Reserved	Reserved	Reserved	Reserved
		1: disable 0: enable					

2.4G ePA DPD Calibration Bit Fields Description

Offset	Field	Description
50h	4:0	Reserved
	5	2.4G ePA Tx DPD calibration disable bit 1: disable(default) 0: enable
	7:6	Reserved

2.12 5G ePA DPD Calibraion (0x51)

7	6	5	4	3	2	1	0
Reserved	Reserved	5G ePA Tx DPD calibration disable bit	Reserved	Reserved	Reserved	Reserved	Reserved
		1: disable 0: enable					

5G ePA DPD Calibration Bit Fields Description

Offset	Field	Description
51h	4:0	Reserved
	5	5G ePA Tx DPD calibration disable bit 1: disable(default) 0: enable
	7:6	Reserved

2.13 Calibration Data to Flash (0x52)

7	6	5	4	3	2	1	0
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved	Off-line Rx Calibration valid bit to flash	Off-line TX DPD valid bit to flash
						0 : disable 1 : enable	0 : disable 1 : enable

Calibration Data to Flash Bit Fields Description

Offset	Field	Description
52h	0	Off-line TX DPD valid bit to flash 0: Disable 2G/5G Off-Line TXDPD Table (Default) 1: Enable 2G/5G Off-Line TXDPD Table
	1	Off-line Rx Calibration valid bit to flash 0: Disable 2G/5G Off-Line RX Cal. Table (Default) 1: Enable 2G/5G Off-Line RX Cal. Table
	7:2	Reserved

2.14 Thermal Sensor Calibration(0x55)

It's thermal sensor calibration value from FT.

7	6	5	4	3	2	1	0
Thermal cal. Enable bit	Thermal sensor calibration offset value						
0 : disable 1 : enable	Thermal sensor calibration offset value						

2.15 2.4G Tx0 Power Slope /offset (0x56h~0x57h)

Driver compares current TSSI value with this TSSI reference value as a base to decide if real-

time TX power compensation is required. 0xFF will be treated as invalid value. This function is controlled by 0x37[6:5].

2.16 2.4G Tx Target Power (0x58/5E/64/6Ah)

Under iPA TSSI on condition, 0x58 defines the TX0/TX1/TX2/TX3 2.4G target power at 54M. 1step = 0.5dBm.

Under ePA TSSI off condition, 0x58, 0x5E, 0x64 and 0x6A defines the TX0/TX1/TX2/TX3 2.4G DAC setting. It didn't represent dBm information.

2.17 2.4G Tx0 Power low/middle/high Channel (59h~5Bh)

0x59~0x5B are used as channel TX power compensation in customer production line.

Customers could set different TX power compensation value according to different PCB design to reach flatter power responds.

For example

If customers found PCB had 1.5dB higher power variation in low channels and 1.5dB lower power variation in high channels.

Customer could use channel compensation offset to get flatter performance like setting as below.

Offset	Description	7	6	5	4	3	2	1	0
--------	-------------	---	---	---	---	---	---	---	---

Offset	Description	7	6	5	4	3	2	1	0
59h~5Bh	Description	Power compensation enable bit 0 : disable 1 : enable	1: increase Tx power with the delta value 0:decrease Tx power with the delta value	Power delta related to origin target power Unit : 0.5dB					
0x59	TX0 2.4G Tx power offset low (CH1~6)(delta,dB)	0x83=> means SW will decrease 3 step(around -1.5dB) corresponding to TX0 2.4G TX power setting.							
0x5A	TX0 2.4G Tx power offset middle (CH7~10)(delta,dB)	0x80=> means SW will decrease 0 step(around 0dB) corresponding to TX0 2.4G TX power setting.							
0x5B	TX0 2.4G Tx power offset high (CH11~14)(delta,dB)	0xC3=> means SW will increase 3 step(around +1.5dB) corresponding to TX0 2.4G TX power setting.							

2.18 2.4G Tx1 Power Slope /offset (0x5Ch~0x5Dh)

The same description of 2.4G Tx0 PowerSlop/offset but it's Tx1 setting.

2.19 2.4G Tx1 Power offset low/middle/high Channel(0x5Fh~0x61h)

The same description of Tx0 Power offset low/middle/high but it's Tx1 setting.

2.20 2.4G Tx2 Power Slope /offset (0x62h~0x63h)

The same description of 2.4G Tx0 PowerSlop/offset but it's Tx2 setting.

2.21 2.4G Tx2 Power offset low/middle/high Channel(0x65h~0x67h)

The same description of Tx0 Power offset low/middle/high but it's Tx2 setting.

2.22 2.4G Tx3 Power Slope /offset (0x68h~0x69h)

The same description of 2.4G Tx0 PowerSlop/offset but it's Tx3 setting.

2.23 2.4G Tx3 Power offset low/middle/high Channel(0x6Bh~0x6Dh)

The same description of Tx0 Power offset low/middle/high but it's Tx3 setting.

2.24 Tx Power Slop / offset for 5G (0x6E~0xBD, 0x140~0x18F)

The mapping table of group to frequency range

Group	Frequency range
Group0	4910~5140MHz
Group1	5140~5250MHz
Group2	5250~5360MHz
Group3	5360~5470MHz
Group4	5470~5580MHz
Group5	5580~5690MHz
Group6	5690~5800MHz
Group7	5800~5925MHz

Each group will refer to its TX0 TSSI slope and offset (in 0x6E~0x92).

6Fh/6Eh	TSSI 5G offset for Group0	TSSI 5G slop for Group0
74h/73h	TSSI 5G offset for Group1	TSSI 5G slop for Group1
79h/78h	TSSI 5G offset for Group2	TSSI 5G slop for Group2
7Eh/7Dh	TSSI 5G offset for Group3	TSSI 5G slop for Group3
83h/82h	TSSI 5G offset for Group4	TSSI 5G slop for Group4
88h/87h	TSSI 5G offset for Group5	TSSI 5G slop for Group5
8Dh/8Ch	TSSI 5G offset for Group6	TSSI 5G slop for Group6
92h/91h	TSSI 5G offset for Group7	TSSI 5G slop for Group7

Each group will refer to its TX1 TSSI slope and offset (in 0x96~0xBA).

97h/96h	TSSI 5G offset for Group0	TSSI 5G slop for Group0
9Ch/9Bh	TSSI 5G offset for Group1	TSSI 5G slop for Group1
A1h/A0h	TSSI 5G offset for Group2	TSSI 5G slop for Group2
A6h/A5h	TSSI 5G offset for Group3	TSSI 5G slop for Group3
ABh/AAh	TSSI 5G offset for Group4	TSSI 5G slop for Group4
B0h/AFh	TSSI 5G offset for Group5	TSSI 5G slop for Group5
B5h/B4h	TSSI 5G offset for Group6	TSSI 5G slop for Group6
BAh/B9h	TSSI 5G offset for Group7	TSSI 5G slop for Group7

Each group will refer to its TX2 TSSI slope and offset (in 0x140~0x164).

141h/140h	TSSI 5G offset for Group0	TSSI 5G slop for Group0
146h/145h	TSSI 5G offset for Group1	TSSI 5G slop for Group1
14Bh/14Ah	TSSI 5G offset for Group2	TSSI 5G slop for Group2

150h/14Fh	TSSI 5G offset for Group3	TSSI 5G slop for Group3
155h/154h	TSSI 5G offset for Group4	TSSI 5G slop for Group4
15Ah/159h	TSSI 5G offset for Group5	TSSI 5G slop for Group5
15Fh/15Eh	TSSI 5G offset for Group6	TSSI 5G slop for Group6
164h/163h	TSSI 5G offset for Group7	TSSI 5G slop for Group7

Each group will refer to its TX3 TSSI slope and offset (in 0x168~0x18C).

169h/168h	TSSI 5G offset for Group0	TSSI 5G slop for Group0
16Eh/16Dh	TSSI 5G offset for Group1	TSSI 5G slop for Group1
173h/172h	TSSI 5G offset for Group2	TSSI 5G slop for Group2
178h/177h	TSSI 5G offset for Group3	TSSI 5G slop for Group3
17Dh/17Ch	TSSI 5G offset for Group4	TSSI 5G slop for Group4
182h/181h	TSSI 5G offset for Group5	TSSI 5G slop for Group5
187h/186h	TSSI 5G offset for Group6	TSSI 5G slop for Group6
18Ch/18Bh	TSSI 5G offset for Group7	TSSI 5G slop for Group7

2.25 5G TX Target Power

Under iPA TSSI on condition, 0x70/75/7A/7F/84/89/8E/93 define the TX0~3 group0~7 5G target power at 54M. 1step = 0.5dBm.

Under ePA TSSI off condition, 0x70/75/7A/7F/84/89/8E/93 define the TX0 group0~7 5G DAC setting. It didn't represent dBm information.

Under ePA TSSI off condition, 0x98/9D/A2/A7/AC/B1/B6/BB define the TX1 group0~7 5G DAC setting. It didn't represent dBm information.

Under ePA TSSI off condition, 0x142/147/14C/151/156/15B/160/165 define the TX2 group0~7 5G DAC setting. It didn't represent dBm information.

Under ePA TSSI off condition, 0x16A/16F/174/179/17E/183/188/18D define the TX3 group0~7 5G DAC setting. It didn't represent dBm information.

iPA TSSI example

0x70	TX0 5G TX power (54M,dBm,絕對值) (4910~5140)
0x75	TX0 5G TX power (54M,dBm,絕對值) (5140~5250)
0x7A	TX0 5G TX power (54M,dBm,絕對值) (5250~5360)
0x7F	TX0 5G TX power (54M,dBm,絕對值) (5360~5470)(Reserved)
0x84	TX0 5G TX power (54M,dBm,絕對值) (5470~5580)
0x89	TX0 5G TX power (54M,dBm,絕對值) (5580~5690)
0x8E	TX0 5G TX power (54M,dBm,絕對值) (5690~5800)

0x93	TX0 5G TX power (54M,dBm,絕對值)(5800~5925)
0x98	TX1 5G TX power (54M,dBm,絕對值) (4910~5140)
0x9D	TX1 5G TX power (54M,dBm,絕對值) (5140~5250)
0xA2	TX1 5G TX power (54M,dBm,絕對值) (5250~5360)
0xA7	TX1 5G TX power (54M,dBm,絕對值) (5360~5470)(Reserved)
0xAC	TX1 5G TX power (54M,dBm,絕對值) (5470~5580)
0xB1	TX1 5G TX power (54M,dBm,絕對值) (5580~5690)
0xB6	TX1 5G TX power (54M,dBm,絕對值) (5690~5800)
0xBB	TX1 5G TX power (54M,dBm,絕對值)(5800~5925)
0x142	TX2 5G TX power (54M,dBm,絕對值) (4910~5140)
0x147	TX2 5G TX power (54M,dBm,絕對值) (5140~5250)
0x14C	TX2 5G TX power (54M,dBm,絕對值) (5250~5360)
0x151	TX2 5G TX power (54M,dBm,絕對值) (5360~5470)(Reserved)
0x156	TX2 5G TX power (54M,dBm,絕對值) (5470~5580)
0x15B	TX2 5G TX power (54M,dBm,絕對值) (5580~5690)
0x160	TX2 5G TX power (54M,dBm,絕對值) (5690~5800)
0x165	TX2 5G TX power (54M,dBm,絕對值)(5800~5925)
0x16A	TX3 5G TX power (54M,dBm,絕對值) (4910~5140)
0x16F	TX3 5G TX power (54M,dBm,絕對值) (5140~5250)
0x174	TX3 5G TX power (54M,dBm,絕對值) (5250~5360)
0x179	TX3 5G TX power (54M,dBm,絕對值) (5360~5470)(Reserved)
0x17E	TX3 5G TX power (54M,dBm,絕對值) (5470~5580)
0x183	TX3 5G TX power (54M,dBm,絕對值) (5580~5690)
0x188	TX3 5G TX power (54M,dBm,絕對值) (5690~5800)
0x18D	TX3 5G TX power (54M,dBm,絕對值)(5800~5925)

2.26 2.4G Tx rate power configuration (0xBEh~0xD4h, 0xF0h)

Default value=0x00, 6bit compensated value. (1 step=0.5dBm)

0xBE~0xD4 are used as TX rate power configuration in customer production line.

Customers could set different TX rate power according to different RF power requirement.

Offset	Field	Description
BEh ~D4h, F0h	5:0	Tx per-rate power setting 6bit compensated value. (1 step=0.5dBm)
	6	Operation bit for compensation vale

		0 : decrease , 1 : increase
	7	Power compensation enable bit 0 : disable 1 : enable

The 1 step=0.5dBm.

Offset	Default Value	Description	Bit [5:0]
BEh		2.4GHz TX power for CCK 1M/2M(delta,dB)	TX power setting
BFh		2.4GHz TX power for CCK 5.5M/11M(delta,dB)	TX power setting
C0h		2.4GHz TX power for OFDM 6M/9M(delta,dB)	TX power setting
C1h		2.4GHz TX power for OFDM 12M/18M(delta,dB)	TX power setting
C2h		2.4GHz TX power for OFDM 24M/36M(delta,dB)	TX power setting
C3h		2.4GHz TX power for OFDM 48M(delta,dB)	TX power setting
C4h		2.4GHz TX power for OFDM 54M(delta,dB)	TX power setting
C5h		2.4G TX power for HT20 MCS=0/8/16/24(delta,dB) 2.4G Tx power for VHT20 MCS=0; 1SS~4SS(delta,dB)	TX power setting
C6h		2.4G TX power for HT40 MCS=32(delta,dB)	TX power setting
C7h		2.4G TX power for HT20 MCS=1,2/9,10/17,18/25,26(delta,dB) 2.4G TX power for VHT20 MCS1/2; 1SS~4SS(delta, dB)	TX power setting
C8h		2.4G TX power for HT20 MCS=3,4/11,12/19,20/27,28(delta,dB) 2.4G TX power for VHT20 MCS=3,4 ; 1SS~4SS(delta,dB)	TX power setting
C9h		2.4G TX power for HT20 MCS=5/13/21/29(delta,dB)	TX power setting
CAh		2.4G TX power for HT20 MCS=6/14/22/30(delta,dB) 2.4G TX power for VHT20 MCS=5, 6; 1SS~4SS(delta,dB)	TX power setting
CBh		2.4G TX power for HT20 MCS=7/15/23/31(delta,dB) 2.4G TX power for VHT20 MCS=7; 1SS~4SS(delta,dB)	TX power setting
CCh		2.4G Tx power for VHT20 MCS8(1SS~4SS)(delta,dB)	TX power setting

CDh		2.4G TX power for HT40 MCS=0/8/16/24(delta,dB)	TX power setting
CEh		2.4G TX power for HT40 MCS=1,2/9,10/17,18/25,26(delta,dB)	TX power setting
CFh		2.4G TX power for HT40 MCS=3,4/11,12/19,20/27,28(delta,dB)	TX power setting
D0h		2.4G TX power for HT40 MCS=5/13/21/29(delta,dB)	TX power setting
D1h		2.4G TX power for HT40 MCS=6/14/22/30(delta,dB)	TX power setting
D2h		2.4G TX power for HT40 MCS=7/15/23/31(delta,dB)	TX power setting
D3h		2.4G Tx power delta for VHT40 (delta,dB) reference point VHT20	TX power setting
D4h		2.4G Tx power delta for LG VHT40 duplicate mode(delta,dB)	TX power setting
F0h		2.4G TX power for VHT20 MCS=9; 3SS (delta,dB)	TX power setting

Example:

If the table content is :

Offset	Ex. Value	Description	Example description
BEh	C3	2G TX power for CCK 1M/2M	0xC3=> 2G 1~11M & 6~18M will have 1.5dB higher power than 54M. 0x00=> 2G 24~54M will have equal power with 54M.
BEh	C3	2G TX power for CCK 5.5M/11M	
C0h	C3	2G TX power for OFDM 6M/9M	
C1h	C3	2G TX power for OFDM 12M/18M	
C2h	0	2G TX power for OFDM 24M/36M	
C3h	0	2G TX power for OFDM 48M	
C4h	0	2G TX power for OFDM 54M	0xC2=> 2G HT MCS0~3 & MCS8~11 will have 1dB higher power than 54M. 0x82=> 2G HT MCS4~7 & MCS12~15 will have 1dB lower power than 54M. 0xC2=> 5G HT MCS0~3 & MCS8~11 will have 1dB higher power than 54M. 5G VHT MCS0~3 will have 1dB higher power than 54M. 0x82=> 5G HT MCS4~7 & MCS12~15 will have 1dB lower power than 54M. 5G VHT MCS4~7 will have 1dB lower power than 54M.
C5h	C2	2G TX power for HT/VHT MCS=0/8/16/24	
C6h	C2	2G TX power for HT/VHT MCS=32	
C7h	82	2G TX power for HT/VHT MCS=1,2/9,10	
C8h	82	2.4G TX power for HT20 MCS=1,2/9,10/17,18/25,26(delta,dB)	
C9h	C2	2.4G TX power for HT20 MCS=5/13/21/29(delta,dB)	
CAh	C2	2.4G TX power for HT20 MCS=6/14/22/30(delta,dB)	
CBh	82	2.4G TX power for HT20 MCS=7/15/23/31(delta,dB)	

2.27 TSSI off 2.4/5G TX power SKU (0xF2, 0xF3)

Unit: 0.5dBm

Driver will use this value as reference target power of SKU function.

TSSI off:

If 5G 54M target power is 13dBm, $13\text{dBm} = 13 \times 2 = 26(\text{dec}) = 0x1A(\text{hex})$

0xF3 offset should be filled with 0x1A value.

Offset	Description
0xF2	TSSI off 2.4G TX power (54Mbps, dBm)
0xF3	TSSI off 5G TX power (54Mbps, dBm)

2.28 Frequency offset (0xF4/0xF5/0xF6)

Offset	Field	Description
F4h	6:0	Crystal trim code
	7	Crystal trim code valid bit 0 : non-valid , rom code will apply default value as crystal trim code 1: valid, rom code will apply 0xF4[6:0]'s value as crystal trim code.
F5h	5:0	Crystal trim code 2nd compensation value
	6	Crystal trim increase/decrease bit 0 : increase 1: decrease
	7	Crystal trim code 2 nd compensation enable/disable bit 0 :disable 1: enable
F6h	5:0	Crystal trim code 3rd compensation value
	6	Crystal trim increase/decrease bit 0 : increase 1: decrease
	7	Crystal trim code 3 rd compensation enable/disable bit 0 :disable 1: enable

0xF4 is used for MTK FT test only for crystal i-cal feature.

MTK wafer manufactory used 0xF4, bit 0~6, to store frequency offset value which is measured under MTK FT environment. Each IC has each corresponding frequency offset.

Bit 7 of 0xF4 is used to enable to apply crystal code value. "1" means enable and "0" means disable. While Bit7 is 0 (disable), it means rom code will not use crystal value of 0xF4 but use crystal code default value in rom code. Default is "1" (enable).

0xF5/0xF6 is used for crystal re-calibration purpose in customer production line

If customers want to re-do frequency trimming in customer production line, please use 0xF5/F6 as second /third frequency offset. Rom/Firmware code will check 0xF5/0xF6 Bit7 to decide the crystal trim code need to be compensated or not. Here is the formula:

If (0xF4[7] == 1 && 0xF5[7] == 1 && 0xF6[7] == 1)

Final xtal trim code = 0xF4[6:0] +/- 0xF5[5:0] +/- 0xF6[5:0];

// the increase/decrease(+/-) depends on 0xF5/F6[6]'s value

Else if((0xF4[7] == 1 && 0xF5[7] == 1)

Final xtal trim code = 0xF4[6:0] +/- 0xF5[5:0];

Else if((0xF4[7] == 1)

Final xtal trim code = 0xF4[6:0];

Else

Use rom code default vale.

2.29 WF Rcal Result (0xF7/0xFF)

Offset	Field	Description
F4h	3:0	Rcal0 Result value
	7	Rcal0 valid bit It's the valid bit of WF Rcal result. 0 : non valid , please use default value 1 : valid , please use WF Rcal result
F5h	3:0	Rcal1 Result value
	7	Rcal1 valid bit It's the valid bit of WF Rcal result. 0 : non valid , please use default value 1 : valid , please use WF Rcal result

2.30 Thermal Sensor Compensation(0xF8)

It's thermal sensor offset compensated value

7	6	5	4	3	2	1	0
Thermal comp.. Enable bit	Reserved			Thermal compensation value			
0 : disable 1 : enable							

2.31 5G Tx rate power configuration (0xD5h~0xEFh)

Default value=0x00, 6bit compensated value. (1 step=0.5dBm)
0xD5~0xEF are used as TX rate power configuration in customer production line.
Customers could set different TX rate power according to different RF power requirement.

Offset	Field	Description
D5h ~EFh	5:0	Tx per-rate power setting 6bit compensated value. (1 step=0.5dBm)
	6	Operation bit for compensation vale 0 : decrease , 1 :increase
	7	Power compensation enable bit 0 : disable 1 : enable

The 1 step=0.5dBm.

Offset	Default Value	Description	Bit [5:0]
D5h		5GHz TX power for OFDM 6M/9M(delta,dB)	TX power setting
D6h		5GHz TX power for OFDM 12M/18M(delta,dB)	TX power setting
D7h		5GHz TX power for OFDM 24M/36M(delta,dB)	TX power setting
D8h		5GHz TX power for OFDM 48M(delta,dB)	TX power setting
D9h		5GHz TX power for OFDM 54M(delta,dB)	TX power setting
DAh		5G TX power for HT20 MCS=0/8/16/24(delta,dB) 5G TX power for VHT20 MCS=0; 1SS~4SS (delta,dB)	TX power setting
DBh		5G TX power for HT40 MCS=32(delta,dB)	TX power setting
DCh		5G TX power for HT20 MCS=1,2/9,10/17,18/25,26(delta,dB) 5G TX power for VHT20 MCS=1,2; 1SS~4SS (delta,dB)	TX power setting
DDh		5G TX power for HT20 MCS=3,4/11,12/19,20/27,28(delta,dB) 5G TX power for VHT20 MCS=3,4; 1SS~4SS (delta,dB)	TX power setting
DEh		5G TX power for HT20 MCS=5/13/21/29(delta,dB) 5G TX power for VHT20 MCS=5; 1SS~4SS (delta,dB)	TX power setting
DFh		5G TX power for HT20 MCS=6/14/22/30(delta,dB) 5G TX power for VHT20 MCS=6; 1SS~4SS (delta,dB)	TX power setting
E0h		5G TX power for HT20 MCS=7/15/23/31(delta,dB) 5G TX power for VHT20 MCS=7; 1SS~4SS (delta,dB)	TX power setting
E1h		5G TX power for VHT20 MCS=8; 1SS~4SS (delta,dB)	TX power setting
E2h		5G TX power for VHT20 MCS=9; 3SS (delta,dB)	TX power setting

E3h		5G TX power for HT40 MCS=0/8/16/24(delta,dB)	TX power setting
E4h		5G TX power for HT40 MCS=1,2/9,10/17,18/25,26(delta,dB)	TX power setting
E5h		5G TX power for HT40 MCS=3,4/11,12/19,20/27,28(delta,dB)	TX power setting
E6h		5G TX power for HT40 MCS=5/13/21/29(delta,dB)	TX power setting
E7h		5G TX power for HT40 MCS=6/14/22/30(delta,dB)	TX power setting
E8h		5G TX power for HT40 MCS=7/15/23/31(delta,dB)	TX power setting
E9h		5G Tx power for delta VHT40 (delta,dB)	TX power setting
EAh		5G Tx power for delta VHT80 (delta,dB)	TX power setting
EBh		5G Tx power for delta VHT160-C (delta,dB)	TX power setting
ECh		5G Tx power for delta VHT160-NC (delta,dB)	
EDh		5G Tx power for delta LG VHT40 duplicate mode(delta,dB)	
EEh		5G Tx power for delta LG VHT80 duplicate mode(delta,dB)	
EFh		5G Tx power for delta LG VHT160 duplicate mode(delta,dB)	

2.32 2.4G eLNA parameter (0x120h~0x125h)

Please refer to 7615 eLNA application note

2.4G eLNA Received Mode (Gain)
2.4G eLNA Received Mode (NF)
2.4G eLNA Received Mode (P1dB)
2.4G eLNA Bypass Mode (Gain)
2.4G eLNA Bypass Mode (NF)
2.4G eLNA Bypass Mode (P1dB)

2.33 5G eLNA parameter (0x126h~0x12Bh)

Please refer to 7615 eLNA application note

5G eLNA Received Mode (Gain)
5G eLNA Received Mode (NF)
5G eLNA Received Mode (P1dB)
5G eLNA Bypass Mode (Gain)
5G eLNA Bypass Mode (NF)
5G eLNA Bypass Mode (P1dB)

2.34 2.4G RSSI parameter (0x130h~0x133h)

Offset	Field	Description
130h ~133h	5:0	RSSI compensation value
	6	1 : increase 0 : decrease
	7	1: valid 0 : invalid

2.35 5G RSSI parameter (0x134h~0x137h)

Offset	Field	Description
134h ~137h	5:0	RSSI compensation value
	6	1 : increase 0 : decrease
	7	1: valid 0 : invalid

2.36 2.4G ePA TC Table (0x190h~0x1A0h)

Please refer to TC (temperature compensation) application note.

2.37 5G ePA TC Table (0x1A2h~0x1B2h)

Please refer to TC (temperature compensation) application note.

2.38 Reserved for Customer (0x138h~0x13Fh)

2.39 eLNA RX Gain Compensation parameter (0x35Eh~0x3ABh)

These setting are defined as total chain RX gain compensation function for better RX gain step accuracy under eLNA condition. User could optimize high gain, middle gain, low gain and ultra low gain difference with this compensation value in different HW design. Please refer to MT7615 application note for more detail.

2GHz

Location	D7	D6	D5	D4	D3	D2	D1	D0	Definition
0x35E	0	0	0	0	0	0	0	0	2G WF0 delta 1 (M) / 2G WF0 delta 0 (H)
0x35F	0	0	0	0	0	0	0	0	2G WF0 delta 3(UL) / 2G WF0 delta 2 (L)
0x360	0	0	0	0	0	0	0	0	2G WF1 delta 1 (M) / 2G WF1 delta 0 (H)
0x361	0	0	0	0	0	0	0	0	2G WF1 delta 3(UL) / 2G WF1 delta 2 (L)
0x362	0	0	0	0	0	0	0	0	2G WF2 delta 1 (M) / 2G WF2 delta 0 (H)
0x363	0	0	0	0	0	0	0	0	2G WF2 delta 3(UL) / 2G WF2 delta 2 (L)
0x364	0	0	0	0	0	0	0	0	2G WF3 delta 1 (M) / 2G WF3 delta 0 (H)
0x365	0	0	0	0	0	0	0	0	2G WF3 delta 3(UL) / 2G WF3 delta 2 (L)

5GHz

Location	D7	D6	D5	D4	D3	D2	D1	D0	Definition
0x366	0	0	0	0	0	0	0	0	5G WF0 group 0 delta 1(M) / 5G WF0 group0 delta 0 (H)
0x367	0	0	0	0	0	0	0	0	5G WF0 group 0 delta 3(UL) / 5G WF0 group0 delta 2(L)
0x368	0	0	0	0	0	0	0	0	5G WF1 group 0 delta 1(M) / 5G WF1 group0 delta 0 (H)
0x369	0	0	0	0	0	0	0	0	5G WF1 group 0 delta 3(UL) / 5G WF1 group0 delta 2(L)
0x36A	0	0	0	0	0	0	0	0	5G WF2 group 0 delta 1(M) / 5G WF2 group0 delta 0 (H)
0x36B	0	0	0	0	0	0	0	0	5G WF2 group 0 delta 3(UL) / 5G WF2 group0 delta 2(L)
0x36C	0	0	0	0	0	0	0	0	5G WF3 group 0 delta 1(M) / 5G WF3 group0 delta 0 (H)
0x36D	0	0	0	0	0	0	0	0	5G WF3 group 0 delta 3(UL) / 5G WF3 group0 delta 2(L)
0x36E	0	0	0	0	0	0	0	0	5G WF0 group 1 delta 1(M) / 5G WF0 group1 delta 0 (H)
0x36F	0	0	0	0	0	0	0	0	5G WF0 group 1 delta 3(UL) / 5G WF0 group1 delta 2(L)
0x370	0	0	0	0	0	0	0	0	5G WF1 group 1 delta 1(M) / 5G WF1 group1 delta 0 (H)
0x371	0	0	0	0	0	0	0	0	5G WF1 group 1delta 3(UL) / 5G WF1 group1 delta 2(L)
0x372	0	0	0	0	0	0	0	0	5G WF2 group 1delta 1(M) / 5G WF2 group1 delta 0 (H)
0x373	0	0	0	0	0	0	0	0	5G WF2 group 1 delta 3(UL) / 5G WF2 group1 delta 2(L)
0x374	0	0	0	0	0	0	0	0	5G WF3 group 1 delta 1(M) / 5G WF3 group1 delta 0 (H)

0x375	0	0	0	0	0	0	0	0	5G WF3 group 1 delta 3(UL) / 5G WF3 group1 delta 2(L)
0x376	0	0	0	0	0	0	0	0	5G WF0 group 2 delta 1(M) / 5G WF0 group2 delta 0 (H)
0x377	0	0	0	0	0	0	0	0	5G WF0 group 2 delta 3(UL) / 5G WF0 group2 delta 2(L)
0x378	0	0	0	0	0	0	0	0	5G WF1 group 2 delta 1(M) / 5G WF1 group2 delta 0 (H)
0x379	0	0	0	0	0	0	0	0	5G WF1 group 2 delta 3(UL) / 5G WF1 group2 delta 2(L)
0x37A	0	0	0	0	0	0	0	0	5G WF2 group 2 delta 1(M) / 5G WF2 group2 delta 0 (H)
0x37B	0	0	0	0	0	0	0	0	5G WF2 group 2 delta 3(UL) / 5G WF2 group2 delta 2(L)
0x37C	0	0	0	0	0	0	0	0	5G WF3 group 2 delta 1(M) / 5G WF3 group2 delta 0 (H)
0x37D	0	0	0	0	0	0	0	0	5G WF3 group 2 delta 3(UL) / 5G WF3 group2 delta 2(L)
0x37E	0	0	0	0	0	0	0	0	5G WF0 group 3 delta 1(M) / 5G WF0 group3 delta 0 (H)
0x37F	0	0	0	0	0	0	0	0	5G WF0 group 3 delta 3(UL) / 5G WF0 group3 delta 2(L)
0x380	0	0	0	0	0	0	0	0	5G WF1 group 3 delta 1(M) / 5G WF1 group3 delta 0 (H)
0x381	0	0	0	0	0	0	0	0	5G WF1 group 3delta 3(UL) / 5G WF1 group3 delta 2(L)
0x382	0	0	0	0	0	0	0	0	5G WF2 group 3delta 1(M) / 5G WF2 group3 delta 0 (H)
0x383	0	0	0	0	0	0	0	0	5G WF2 group 3 delta 3(UL) / 5G WF2 group3 delta 2(L)
0x384	0	0	0	0	0	0	0	0	5G WF3 group 3 delta 1(M) / 5G WF3 group3 delta 0 (H)
0x385	0	0	0	0	0	0	0	0	5G WF3 group 3 delta 3(UL) / 5G WF3 group3 delta 2(L)
0x386	0	0	0	0	0	0	0	0	5G WF0 group 4 delta 1(M) / 5G WF0 group4 delta 0 (H)
0x387	0	0	0	0	0	0	0	0	5G WF0 group 4 delta 3(UL) / 5G WF0 group4 delta 2(L)
0x388	0	0	0	0	0	0	0	0	5G WF1 group 4 delta 1(M) / 5G WF1 group4 delta 0 (H)
0x389	0	0	0	0	0	0	0	0	5G WF1 group 4 delta 3(UL) / 5G WF1 group4 delta 2(L)
0x38A	0	0	0	0	0	0	0	0	5G WF2 group 4 delta 1(M) / 5G WF2 group4 delta 0 (H)
0x38B	0	0	0	0	0	0	0	0	5G WF2 group 4 delta 3(UL) / 5G WF2 group4 delta 2(L)
0x38C	0	0	0	0	0	0	0	0	5G WF3 group 4 delta 1(M) / 5G WF3 group4 delta 0 (H)
0x38D	0	0	0	0	0	0	0	0	5G WF3 group 4 delta 3(UL) / 5G WF3 group4 delta 2(L)
0x38E	0	0	0	0	0	0	0	0	5G WF0 group 5 delta 1(M) / 5G WF0 group5 delta 0 (H)
0x38F	0	0	0	0	0	0	0	0	5G WF0 group 5 delta 3(UL) / 5G WF0 group5 delta 2(L)
0x390	0	0	0	0	0	0	0	0	5G WF1 group 5 delta 1(M) / 5G WF1 group5 delta 0 (H)
0x391	0	0	0	0	0	0	0	0	5G WF1 group 5 delta 3(UL) / 5G WF1 group5 delta 2(L)
0x392	0	0	0	0	0	0	0	0	5G WF2 group 5delta 1(M) / 5G WF2 group5 delta 0 (H)
0x393	0	0	0	0	0	0	0	0	5G WF2 group 5 delta 3(UL) / 5G WF2 group5 delta 2(L)
0x394	0	0	0	0	0	0	0	0	5G WF3 group 5 delta 1(M) / 5G WF3 group5 delta 0 (H)
0x395	0	0	0	0	0	0	0	0	5G WF3 group 5 delta 3(UL) / 5G WF3 group5 delta 2(L)

Location	D7	D6	D5	D4	D3	D2	D1	D0	Definition
0x396	0	0	0	0	0	0	0	0	5G WF0 group 6 delta 1(M) / 5G WF0 group6 delta 0 (H)
0x397	0	0	0	0	0	0	0	0	5G WF0 group 6 delta 3(UL) / 5G WF0 group6 delta 2(L)
0x398	0	0	0	0	0	0	0	0	5G WF1 group 6 delta 1(M) / 5G WF1 group6 delta 0 (H)
0x399	0	0	0	0	0	0	0	0	5G WF1 group 6 delta 3(UL) / 5G WF1 group6 delta 2(L)
0x39A	0	0	0	0	0	0	0	0	5G WF2 group 6 delta 1(M) / 5G WF2 group6 delta 0 (H)
0x39B	0	0	0	0	0	0	0	0	5G WF2 group 6 delta 3(UL) / 5G WF2 group6 delta 2(L)
0x39C	0	0	0	0	0	0	0	0	5G WF3 group 6 delta 1(M) / 5G WF3 group6 delta 0 (H)
0x39D	0	0	0	0	0	0	0	0	5G WF3 group 6 delta 3(UL) / 5G WF3 group6 delta 2(L)
0x39E	0	0	0	0	0	0	0	0	5G WF0 group 7 delta 1(M) / 5G WF0 group7 delta 0 (H)
0x39F	0	0	0	0	0	0	0	0	5G WF0 group 7 delta 3(UL) / 5G WF0 group7 delta 2(L)
0x3A0	0	0	0	0	0	0	0	0	5G WF1 group 7 delta 1(M) / 5G WF1 group7 delta 0 (H)
0x3A1	0	0	0	0	0	0	0	0	5G WF1 group 7 delta 3(UL) / 5G WF1 group7 delta 2(L)
0x3A2	0	0	0	0	0	0	0	0	5G WF2 group 7 delta 1(M) / 5G WF2 group7 delta 0 (H)
0x3A3	0	0	0	0	0	0	0	0	5G WF2 group 7 delta 3(UL) / 5G WF2 group7 delta 2(L)
0x3A4	0	0	0	0	0	0	0	0	5G WF3 group 7 delta 1(M) / 5G WF3 group7 delta 0 (H)
0x3A5	0	0	0	0	0	0	0	0	5G WF3 group 7 delta 3(UL) / 5G WF3 group7 delta 2(L)
0x3A6	0	0	0	0	0	0	0	0	[b1]2G gain compensation valid bit [b0]5G gain compensation valid bit